

## Policy Analysis on Forest and Land Fire Prevention and Management in Jambi Province

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### Abstract

**Introduction:** Forest and land fires are major environmental problems in Indonesia, particularly in peatland areas of Jambi Province, where fires occur almost every year and cause ecological, social, and economic impacts. **Objective:** This study aimed to analyze forest and land fire prevention and control policies and determine priority control strategies in Jambi Province using SWOT and Analytical Hierarchy Process (AHP). **Method:** This study used a descriptive qualitative approach. Data were collected through interviews, questionnaires, and documentation involving stakeholders related to forest and land fire management. SWOT analysis was used to identify internal and external factors, while AHP was applied to determine strategic priorities. **Results and Discussion:** The results showed that forest and land fires in Jambi Province still occurred annually during 2015–2024, with the highest number of hotspots recorded in 2019 at 3,539 hotspots. SWOT analysis placed the fire control strategy in Quadrant I, indicating that strengths and opportunities could support fire management efforts. The AHP analysis identified strengthening forest fire task forces based on hotspot monitoring technology and early warning systems as the main priority strategy with a global weight value of 0.348742384. **Conclusion:** Strengthening institutional capacity and utilizing hotspot-based information technology and early warning systems are important strategies for improving forest and land fire prevention and control in Jambi Province.

## **Introduction**

Forest and land fires are among the environmental problems that continue to occur in Indonesia and have widespread impacts on ecological, social, economic, and public health aspects. This phenomenon has increasingly intensified along with climate change, which triggers rising air temperatures and changes in rainfall patterns, particularly during prolonged dry seasons. In addition to climatic factors, human activities involving land clearing through burning have also become one of the primary causes of the increasing incidence of forest and land fires in various regions of Indonesia. The resulting impacts include not only ecosystem degradation and loss of biodiversity, but also deterioration in environmental quality and disruption of community social and economic activities (Husin, 2022); (Qamariyanti et al., 2023); (Siregar et al., 2021); (Ramadhan, 2025); (Fitriandhini & Putra, 2022). From a public health perspective, smoke from forest and land fires generates hazardous particulate matter, particularly PM<sub>2.5</sub> and PM<sub>10</sub>, as well as toxic gases such as carbon monoxide (CO) and polycyclic aromatic hydrocarbons (PAHs), which have been shown to significantly increase the risk of acute respiratory infections, asthma exacerbation, chronic obstructive pulmonary disease (COPD), and cardiovascular disorders among exposed populations. Epidemiological studies have documented a substantial increase in respiratory disease morbidity and premature mortality during fire seasons, with vulnerable groups including children, the elderly, and individuals with pre-existing conditions bearing a disproportionate health burden.

Jambi Province is one of the regions in Indonesia with a relatively high level of vulnerability to forest and land fires, particularly in peatland areas. Over the past ten years, forest and land fires in Jambi Province have repeatedly occurred with fluctuating intensity. The largest fires were recorded in 2015 and 2019, with burned areas reaching approximately ±121,248 ha and ±56,592 ha, respectively, while in 2023 the burned area reached approximately ±6,539 ha (Jambi Provincial Forestry Office, 2024). These conditions indicate that forest and land fires remain a serious threat to environmental sustainability in Jambi Province, especially in areas characterized by peatlands that are highly flammable and difficult to extinguish. The health consequences for communities residing in fire-prone areas of Jambi are particularly concerning, as prolonged smoke exposure during peak fire seasons has been associated with elevated hospital admissions for respiratory and cardiovascular conditions, placing considerable strain on local health systems.

Various forest and land fire control policies have been issued by both the central government and regional governments as efforts to prevent and manage forest and land fires (Wahyudi, 2021). However, forest and land fires continue to occur almost every year. This condition indicates that the implementation of forest and land fire control policies has not yet been fully effective due to various constraints, including limited facilities and infrastructure, inter-agency coordination, funding, and community involvement in fire management activities (Ananda et al., 2022); (Syarifah et al., 2020). The persistent recurrence of fires also suggests that public health protection measures, including early warning systems, community health preparedness, and smoke-related emergency response protocols, have not been adequately integrated into existing fire management frameworks (Rahmah & Hamdi, 2022); (Rumahorbo & Dione, 2025); (Atmaja, 2023).

Previous studies have mainly focused on the causes and impacts of forest and land fires, whereas studies examining the implementation of forest and land fire control policies comprehensively and formulating priority control strategies remain relatively

limited, particularly in Jambi Province. Furthermore, the intersection between environmental policy and public health outcomes in the context of forest and land fires remains an underexplored area in the Indonesian literature, despite the well-documented health burden associated with fire-related smoke exposure. Therefore, this study is important to analyze the implementation of forest and land fire control policies and formulate more effective policy strategies through the SWOT and Analytical Hierarchy Process (AHP) approaches. These approaches are used to identify internal and external factors influencing policy implementation while determining priority strategies for forest and land fire management in Jambi Province.

This study aims to describe the general condition of forest and land fires in Jambi Province, analyze the implementation of forest and land fire prevention and control policies, and formulate priority strategies for forest and land fire management in Jambi Province. The results of this study are expected to contribute scientifically to the development of environmental policy studies, particularly those related to strategic analysis-based forest and land fire control. In addition, this study is expected to serve as a reference for regional governments and stakeholders in improving the effectiveness of sustainable forest and land fire control policies.

## **Method**

This study employed a descriptive qualitative approach to analyze the implementation of forest and land fire prevention and control policies in Jambi Province. The qualitative approach was selected because it is capable of providing an in-depth understanding of forest and land fire control conditions, including the internal and external factors influencing policy implementation in the field. Descriptive research was used to objectively describe phenomena according to the actual conditions occurring in the study area (Notoatmodjo, 2018). This approach enabled researchers to obtain more comprehensive information through direct interaction with informants involved in forest and land fire control activities (Sugiyono, 2019).

The research population consisted of parties involved in the implementation of forest and land fire control in Jambi Province. The sampling technique used was purposive sampling combined with a snowball sampling approach. Purposive sampling was employed to select respondents who were considered to have knowledge, experience, and direct involvement in the implementation of forest and land fire control policies, while snowball sampling was used to obtain additional informants based on recommendations from previous respondents (Sugiyono, 2019). The number of respondents in this study was nine individuals consisting of stakeholders related to forest and land fire control in Jambi Province.

The research instruments used included interview guidelines, questionnaires, and documentation. Interview instruments were used to obtain information regarding the implementation of forest and land fire control policies, while questionnaires were used to assess internal and external factors in the SWOT and AHP analyses. The analyzed indicators included strengths, weaknesses, opportunities, and threats influencing forest and land fire control policies in Jambi Province.

Data analysis was conducted using the interactive analysis model developed by Miles and Huberman, which includes data reduction, data presentation, and conclusion drawing carried out continuously throughout the research process. Policy strategy analysis was conducted using the SWOT method to identify internal and external factors affecting the implementation of forest and land fire control policies. Furthermore, the

Analytical Hierarchy Process (AHP) method was applied to determine priority control strategies based on the importance level of each strategic alternative. Consistency testing in the AHP method was conducted using the Consistency Ratio (CR) value with a consistency threshold of  $\leq 0.1$  as proposed by Thomas L. Saaty.

## Result and Discussion

### Distribution of Hotspots in Forest and Land Fire Areas in Jambi Province

A hotspot is a term used to indicate pixels with temperature values above a certain threshold based on satellite image interpretation. High temperature values are associated with the presence of active fire on the earth's surface as indicated by brightness temperature values (Sitanggang et al., 2018). Hotspots can be used as an early indicator of forest and land fires (Saharjo and Nasution, 2021). The higher the number of hotspots, the greater the potential for forest and land fires in an area, although the presence of hotspots does not always directly indicate an actual fire event. Nevertheless, hotspots remain an important indicator in the early identification of forest and land fires (Endrawati, 2016).

Based on hotspot data for the 2015–2024 period, Jambi Province experienced forest and land fire events almost every year. The highest number of hotspots occurred in 2019, reaching 3,539 points, while in 2015 there were 2,627 points. In contrast, the number of hotspots declined significantly during the 2020–2024 period. This condition indicates that forest and land fire events in Jambi Province followed a fluctuating pattern influenced by climatic conditions, land-clearing activities, and the biophysical characteristics of the region.

**Table 1**  
Annual recap of hotspots for the 2015–2024 period in Jambi Province

No	Regency	Year									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Batanghari	87	1	3	2	52	0	0	2	30	6
2	Bungo	45	1	1	0	8	2	0	1	1	0
3	Kerinci	10	1	0	0	1	0	0	0	0	0
4	Merangin	40	0	0	4	14	3	1	4	16	13
5	Muaro Jambi	1.272	0	0	28	2.445	0	0	0	1	40
6	Sarolangun	238	0	3	2	125	1	0	3	33	23
7	Tanjung Jabung Barat	60	0	1	13	63	0	0	0	10	2
8	Tanjung Jabung Timur	613	0	0	0	770	0	0	0	2	0
9	Tebo	262	7	14	19	61	1	0	0	14	11
	<b>Grand Total</b>	<b>2.627</b>	<b>10</b>	<b>22</b>	<b>68</b>	<b>3.539</b>	<b>7</b>	<b>1</b>	<b>10</b>	<b>107</b>	<b>95</b>

The table shows that Muaro Jambi Regency was the area with the highest number of hotspots in 2015 and 2019, with 1,272 and 2,445 points, respectively. The high number of hotspots in this area was followed by Tanjung Jabung Timur Regency and Sarolangun Regency. In 2015, the number of hotspots in Tanjung Jabung Timur Regency reached 613 points and increased to 770 points in 2019, while Sarolangun Regency recorded 238 points in 2015 and 125 points in 2019. The high number of hotspots in these areas indicates that the eastern part of Jambi Province has a higher fire vulnerability than other regions, especially in areas dominated by peatland. The concentration of hotspots in peatland-dominated areas is particularly concerning from a public health standpoint, as peat fires tend to produce denser and more prolonged smoke emissions compared to

mineral soil fires, thereby intensifying community exposure to hazardous particulate matter and increasing the risk of acute respiratory infections (ISPA), asthma, and other respiratory and cardiovascular disorders among populations residing in surrounding areas

### **Distribution of Hotspots in Forest Areas**

The hotspot data in relation to forest areas showed that in 2015, 22.38% of hotspots were located in production forest areas (HP), 21.81% in limited production forest areas (HPT), 15.30% in conservation areas, 3.24% in protected forest areas (HL), 0.19% in convertible production forest areas (HPK), and 37.08% in other land use areas. Meanwhile, in 2019, hotspots were more dominantly distributed in limited production forest areas (33.68%), followed by conservation areas (15.94%), production forest areas (11.47%), protected forest areas (7.69%), convertible production forest areas (0.34%), and other land use areas at 30.88%.

These findings indicate that forest and land fire events in Jambi Province not only occurred in cultivation areas and other land use areas, but had also spread into production forest areas and conservation areas. The high number of hotspots in limited production forest areas and other land use areas indicates pressure from human activities on forest regions, particularly due to land clearing and peatland ecosystem degradation. This condition demonstrates that forest and land fire control in Jambi Province requires more intensive monitoring in areas with high vulnerability levels, especially in production forest areas and peatlands. From an environmental health perspective, the spread of fire events into conservation and production forest areas further exacerbates air quality degradation across a wider geographic scale, increasing the population potentially exposed to smoke-related health hazards. The dispersion of smoke from these forested and peatland areas can extend beyond administrative boundaries, affecting communities in neighboring districts and potentially causing regional public health crises during peak fire seasons.

### **Forest and Land Fire Control Strategy in Jambi Province**

The forest and land fire control strategy in Jambi Province was formulated using SWOT (Strength, Weakness, Opportunity, Threat) analysis and the Analytical Hierarchy Process (AHP). SWOT analysis was applied to identify the internal and external factors influencing the implementation of forest and land fire control in Jambi Province. The data analysis was obtained through the identification of the existing conditions of forest and land fire control as well as interviews with respondents from related institutions directly involved in forest and land fire management activities.

#### **Internal Factors**

Internal factors consist of strengths and weaknesses. The strength and weakness factors related to forest and land fire control in Jambi Province are presented in Table 2 below.

**Table 2**  
 Assessment of Strength and Weakness Factors

NO	Strength Assessment (S)	Weight	Rating	Score (B x R)
1	Availability of regional regulations related to forest and land fire control in Jambi Province	0.24	3.67	0.89
2	Availability of a Forest and Land Fire Control Task Force (Satgas) in Jambi Province	0.26	4.00	1.05
3	Cross-institutional support in forest and land fire control	0.24	3.78	0.91
4	Implementation of integrated patrol activities for forest and land fire prevention	0.25	3.89	0.99
	<b>Total</b>	<b>1.00</b>	<b>15.33</b>	<b>3.84</b>
NO	Weakness Assessment (W)	Weight	Rating	Score
1	Limited budget for forest and land fire control activities	0.27	3.89	1.07
2	Limited facilities and infrastructure for forest and land fire suppression	0.27	3.89	1.06
3	Inter-agency operational coordination in forest and land fire control is not yet optimal	0.22	3.22	0.71
4	Community participation in forest and land fire prevention activities remains limited	0.23	3.22	0.75
	<b>Total</b>	<b>1.00</b>	<b>14.22</b>	<b>3.59</b>
	<b>Difference (S - W)</b>			<b>0.25</b>

The analysis results indicate that the main strength factor in forest and land fire control in Jambi Province is the availability of a Forest and Land Fire Control Task Force (Satgas), with a rating value of 4.00, followed by the implementation of integrated patrol activities with a rating of 3.89. In addition, cross-institutional support and the availability of regional regulations also serve as supporting factors in the implementation of forest and land fire control in Jambi Province. The dominance of the Satgas as the highest-rated strength factor reflects the critical institutional role it plays not only in suppressing fires but also in reducing the duration and intensity of smoke exposure experienced by surrounding communities. Early and effective fire suppression by the Satgas directly contributes to minimizing the accumulation of PM2.5 and other toxic pollutants in the air, which are the primary drivers of smoke-related public health impacts including acute respiratory infections and cardiovascular complications.

Meanwhile, the main weakness factors consist of limited budgets and limited fire suppression facilities and infrastructure, each with a rating value of 3.89. Suboptimal inter-agency operational coordination and limited community participation in forest and land fire prevention activities also constitute weakness factors in forest and land fire control in Jambi Province. These weakness factors carry significant implications for public health outcomes. Budget constraints directly limit the capacity for rapid fire response, resulting in prolonged burning periods that extend community smoke exposure. Similarly, limited community participation in prevention activities means that fire ignition sources, particularly land clearing through burning, are not adequately controlled

at the grassroots level, thereby increasing both fire incidence and associated health risks. Based on the internal factor analysis, the difference between the strength and weakness scores was 0.25, indicating that strength factors remain more dominant than weakness factors in forest and land fire control in Jambi Province

**External Factors**

External strategic factors were identified based on the analysis of external environmental conditions influencing the implementation of forest and land fire control in Jambi Province. External factors consist of opportunities and threats related to forest and land fire control in Jambi Province.

**Table 3**  
 Assessment of Opportunity and Threat Factors

NO	Opportunity Assessment (O)	Weight	Rating	Score (B x R)
1	Support from central government policies for forest and land fire control	0.25	3.89	0.98
2	Support for forest and land fire control programs from the central government and related institutions	0.26	3.89	1.00
3	Utilization of information technology in forest and land fire monitoring systems	0.26	3.89	1.00
4	Community support in forest and land fire prevention activities	0.23	3.44	0.80
<b>Total</b>		<b>1.00</b>	<b>15.11</b>	<b>3.79</b>
NO	Threat Assessment (T)	Weight	Rating	Score
1	Prolonged dry season conditions increasing the potential for forest and land fires	0.23	3.11	0.72
2	Land clearing through burning practices	0.28	3.44	0.98
3	Extensive fire-prone areas in Jambi Province	0.26	3.33	0.87
4	Land-use conflicts in forest and land fire-prone areas	0.22	2.67	0.60
<b>Total</b>		<b>1.00</b>	<b>12.56</b>	<b>3.16</b>
<b>Difference (O - T)</b>				<b>0.62</b>

The analysis results indicate that the main opportunity factors in forest and land fire control in Jambi Province are the support for forest and land fire control programs from the central government and related institutions, as well as the utilization of information technology in forest and land fire monitoring systems, both with a rating value of 3.89. In addition, support from central government policies and community participation in forest and land fire prevention activities also represent important opportunities for improving forest and land fire control in Jambi Province. The high rating accorded to information technology utilization as an opportunity factor is particularly significant in the context of environmental health, as real-time hotspot detection and early warning systems enable faster government response, which in turn reduces the duration of fire events and limits the extent of smoke dispersal into populated areas. The earlier a fire is detected and suppressed, the shorter the window of harmful smoke exposure for communities, thereby directly reducing the incidence of smoke-related respiratory and cardiovascular health disorders.

Meanwhile, the primary threat factor is land clearing through burning practices, with a rating value of 3.44. Other threats include the extensive fire-prone areas in Jambi Province, prolonged dry season conditions, and land-use conflicts in areas vulnerable to forest and land fires. The identification of land clearing through burning as the dominant threat factor underscores its dual role as both an environmental and public health hazard. This practice not only destroys forest ecosystems but also generates substantial quantities of smoke containing fine particulate matter and toxic gases that directly threaten the respiratory health of communities in the surrounding areas. Prolonged dry seasons further amplify this threat by accelerating fire spread and intensifying smoke concentration, conditions that have been documented to cause significant surges in hospital admissions for respiratory diseases during peak fire seasons in Jambi Province

**SWOT Analysis Quadrant**

Based on the SWOT analysis results, the strength factor score was 3.84, the weakness factor score was 3.59, the opportunity factor score was 3.79, and the threat factor score was 3.16. The calculation results showed that the difference between the strength and weakness factors was 0.25, while the difference between the opportunity and threat factors was 0.62. These values indicate that the forest and land fire control strategy in Jambi Province is positioned in Quadrant I (positive, positive), as presented in Figure 1.



**Figure 1.** SWOT Analysis Quadrant

## **Policy Analysis on Forest and Land Fire Prevention and Management in Jambi Province**

The Quadrant I position indicates that forest and land fire control in Jambi Province possesses strengths and opportunities that can be utilized to support forest and land fire management efforts. This condition is supported by the existence of regional regulations, the Forest and Land Fire Control Task Force (Satgas), cross-institutional support, and the implementation of integrated patrol activities. In addition, support from central government policies, forest and land fire control programs, the utilization of information technology, and community support provide opportunities to improve the effectiveness of forest and land fire control in Jambi Province. Therefore, the appropriate strategy to be implemented is an aggressive strategy (SO strategy) through the utilization of strengths to maximize opportunities in forest and land fire control efforts. The SO strategy positioning is also highly relevant from a public health perspective, as aggressive and proactive fire prevention measures directly translate into reduced smoke production, lower ambient concentrations of hazardous air pollutants, and consequently a decline in the incidence of smoke-related health disorders such as acute respiratory infections (ISPA), asthma exacerbations, and cardiovascular complications among communities in fire-prone areas of Jambi Province.

### **AHP (Analytical Hierarchy Process)**

The Analytical Hierarchy Process (AHP) method was used to determine the priority strategies for forest and land fire control in Jambi Province based on the results of the SWOT analysis. This method was conducted through pairwise comparisons to obtain the priority weights of each factor and strategic alternative. The weighting results were tested using the Consistency Ratio (CR), and all CR values showed consistent results because they were less than 0.1.

The SWOT–AHP analysis consisted of the main objective, SWOT factors, and strategic alternatives. The SWOT factors included Strength (S), Weakness (W), Opportunity (O), and Threat (T). The main strength factor was the availability of a Forest and Land Fire Control Task Force (Satgas), while the primary weakness factor was limited funding for forest and land fire control activities. The opportunity factor consisted of the utilization of information technology in hotspot monitoring systems and early warning systems, whereas the main threat factor was land clearing through burning practices.

The resulting strategic alternatives consisted of SO, WO, ST, and WT strategies. These strategies included strengthening the implementation of the Forest and Land Fire Control Task Force based on hotspot information technology and early warning systems, optimizing the utilization of information technology in forest and land fire monitoring, strengthening supervision of land clearing through burning practices, and improving cross-sectoral cooperation in forest and land fire control efforts.

### **SWOT Factor Weighting**

The SWOT factors were weighted using the AHP method to determine the level of importance of each internal and external factor in forest and land fire control in Jambi Province. The results of the SWOT factor weighting are presented in Table 4.

**Table 4**  
 SWOT Factor Weighting

SWOT Factor	Weight
Strength (S)	0.329004
Weakness (W)	0.200216
Opportunity (O)	0.329004
Threat (T)	0.141775

The weighting results show that Strength (S) and Opportunity (O) had the highest weight value of 0.329004. This indicates that the forest and land fire control strategy in Jambi Province is more strongly influenced by internal strengths and external opportunities than by weaknesses and threats. The equal weighting of Strength and Opportunity factors reflects a strategic landscape in which existing institutional capacities and technological opportunities are recognized as the most decisive elements in fire management. From a public health standpoint, this finding highlights that maximizing the utilization of these two factors, particularly through the deployment of the Satgas supported by real-time information technology, holds the greatest potential for reducing fire incidence and consequently minimizing smoke-related health burdens on the community. Conversely, the relatively lower weight of the Threat factor, while indicating that threats are currently less dominant, should not be interpreted as diminishing the urgency of addressing land clearing through burning, given its direct and documented impacts on air quality and respiratory health

**Global Weights and Strategy Priorities**

Global weighting was conducted to determine the priority strategies for forest and land fire control in Jambi Province based on the results of the SWOT–AHP analysis. The results of the global weighting and strategic priorities are presented in Table 5.

**Table 5**  
 Global Weights and Priority Strategies for Forest and Land Fire Control

Strategy	Global Weight	Ranking
Strengthening the implementation of the Forest and Land Fire Control Task Force based on hotspot information technology and early warning systems	0.348742384	1
Strengthening the role of the Forest and Land Fire Control Task Force in supervising and preventing land clearing through burning practices	0.266863995	2
Optimizing the utilization of information technology in forest and land fire monitoring to improve control effectiveness under limited budget conditions	0.258716544	3
Enhancing cross-sectoral cooperation in forest and land fire control to address budget limitations and the risks of land clearing through burning practices	0.125677078	4

The SWOT–AHP analysis results indicate that the primary priority strategy in forest and land fire control in Jambi Province is strengthening the implementation of the Forest and Land Fire Control Task Force based on hotspot information technology and early warning systems, with a global weight value of 0.348742384. This strategy carries the highest priority not only because of its operational significance in fire detection and suppression, but also because of its direct implications for protecting community health. The integration of hotspot-based information technology into Satgas operations enables earlier fire detection, faster mobilization of suppression resources, and consequently

shorter fire duration, all of which directly reduce the volume of smoke emissions and the duration of hazardous air quality conditions experienced by surrounding communities. A reduction in smoke exposure duration is clinically significant, as it directly lowers the risk of acute respiratory infections (ISPA), asthma attacks, and other smoke-related health disorders, particularly among vulnerable population groups including children, the elderly, and individuals with pre-existing respiratory or cardiovascular conditions.

The next priority strategy is strengthening the role of the Forest and Land Fire Control Task Force in supervising and preventing land clearing through burning practices, with a weight value of 0.266863995. This strategy is of particular public health relevance because land clearing through burning is the primary anthropogenic source of fire-related smoke in Jambi Province. Effective supervision and enforcement against burning practices would directly reduce the frequency of fire ignition events, thereby preventing the generation of smoke that contributes to elevated PM<sub>2.5</sub> concentrations and increased incidence of respiratory diseases in affected communities.

Furthermore, the strategy of optimizing the utilization of information technology in forest and land fire monitoring to improve control effectiveness under limited budget conditions obtained a weight value of 0.258716544. The close weight proximity between this strategy and the second-ranked strategy underscores that technological optimization and enforcement activities are mutually reinforcing. From an environmental health perspective, enhanced monitoring through information technology not only improves operational efficiency but also enables health authorities to anticipate periods of elevated smoke exposure, facilitating timely public health advisories and protective measures for at-risk populations. The strategy of enhancing cross-sectoral cooperation in forest and land fire control obtained a weight value of 0.125677078. Although ranked fourth, cross-sectoral cooperation holds critical importance for integrating public health responses into fire management frameworks. Effective collaboration between forestry, environmental, and health agencies would enable the development of coordinated smoke exposure monitoring systems, community health preparedness protocols, and rapid medical response mechanisms during fire events, thereby strengthening the overall resilience of communities in Jambi Province against the health impacts of forest and land fires.

Overall, the SWOT–AHP results indicate that forest and land fire control strategies in Jambi Province emphasize strengthening the role of the Forest and Land Fire Control Task Force and utilizing information technology in monitoring, supervision, and prevention activities related to forest and land fires. From a broader environmental health perspective, the implementation of these priority strategies is expected to contribute to a measurable reduction in fire-related smoke exposure, improved ambient air quality, and a decline in smoke-attributable health disorders including acute respiratory infections, asthma, and cardiovascular complications among communities in Jambi Province. The effectiveness of these strategies in achieving public health outcomes should therefore be monitored not only through fire incidence indicators but also through environmental health metrics such as ambient PM<sub>2.5</sub> levels, hotspot response times, and community health data from fire-prone districts

### **Conclusion**

Forest and land fires in Jambi Province continued to occur annually during the 2015–2024 period, with fluctuating numbers of hotspots. The highest number of hotspots occurred in 2019, reaching 3,539 points. The areas with the highest level of vulnerability were Muaro Jambi Regency, Tanjung Jabung Timur Regency, and Sarolangun Regency, which are dominated by peatlands and therefore have a higher fire potential compared to other regions. The implementation of forest and land fire control in Jambi Province has been carried out through the establishment of the Forest and Land Fire Control Task Force (Satgas Karhutla), integrated patrol activities, hotspot monitoring, community outreach programs, as well as ground and aerial fire suppression operations. However, the implementation of forest and land fire control still faces several constraints, including limited budgets, limited facilities and infrastructure, suboptimal inter-agency coordination, and community participation that still needs to be improved. The SWOT–AHP analysis results indicate that the primary priority strategy in forest and land fire control in Jambi Province is strengthening the implementation of the Forest and Land Fire Control Task Force based on hotspot information technology and early warning systems, with a global weight value of 0.348742384. These findings indicate that institutional strengthening and the utilization of information technology are important factors in supporting the effectiveness of forest and land fire control in Jambi Province.

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